



Psychological burden in patients with sellar masses under conservative and surgical management

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Abstract

The aim of this study was to investigate the level of distress and the quality of life of operated and non-operated patients with pituitary tumors. Patients who presented to a neurosurgical center and two endocrinological services for outpatient follow-up after surgical treatment, as well as those under medical therapy or radiological follow-up without treatment, were invited to participate in the study. Sociodemographic, health-related quality of life and clinical data were assessed. Psychosocial factors were measured using the Distress Thermometer (DT), the Hospital Anxiety and Depression Scale (HADS), the Short Form (SF-36), and the Sino-nasal outcome test (SNOT). Thirty-two postoperative patients and thirty conservatively managed patients ($n=21$ under medical treatment, $n=9$ watch and wait), mean age 53, SD 19; 56% female participated in the study. Prolactinomas (35%) and non-functioning pituitary adenomas (21%) were the most common findings. There were no significant differences between conservative and operative groups in mean DT score (4.7 (SD 2.45) vs. 4.9 (SD 3.0), $p=0.61$), HADS anxiety score (6.4 (SD 3.9) vs. 6.0 (SD 4.3), $p=0.76$) or depression score (5.7 (SD 4.8) vs. 4.6 (SD 3.6), $p=0.50$). For patients with ACTH-producing adenomas, the mean anxiety score was significantly higher (10.3 (SD 1.9) vs. 5.9 (SD 4.0), $p=0.03$). The SNOT score correlated significantly with the DT, HADS-A, and HADS-D scores and therefore was associated with higher psychological distress. The level of self-reported distress in patients with sellar processes was not associated with a specific treatment strategy. ACTH-producing adenomas and manifest nasal symptoms were associated with higher psychological distress.

Keywords Sellar mass · Pituitary adenoma · Quality of life · Psychological distress · Anxiety · Depression

Introduction

Sellar masses can originate from a range of sources, including neoplasms, such as pituitary adenoma, craniopharyngioma, and meningioma, to congenital non-neoplastic lesions, such as Rathke cleft cysts. Sellar masses are not uncommon. Pituitary adenomas are the third-most common type of intracranial neoplasms, after meningiomas and gliomas

[25]. Moreover, asymptomatic pituitary macroadenomas were found in 0.3% of healthy individuals undergoing high-resolution MRI [36], autopsy findings report incidental pituitary lesions in over 10% of cases [33]. Due to better diagnostic methods, the incidence of sellar processes has increased in recent years [11]. Even though some sellar tumors cause noticeable symptoms (e.g., Cushing disease or visual field defects), others are diagnosed incidentally and remain asymptomatic. The diagnosis of a CNS tumor can cause considerable distress regardless of tumor entity [15]. Symptoms and active treatment, such as surgery, may affect the patient's socioeconomic situation and ability to work. Undergoing an MRI caused distress in almost 30% of healthy participants who received a whole-body scan [32]. Waiting for the results can also cause significant distress [32]. Moreover, potentially serious incidental findings might require a potentially stressful follow-up [29].

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Patients diagnosed with a sellar masses usually are managed either surgically (e.g., large pituitary adenoma, hormone-active non-prolactinoma), treated with medications (e.g., prolactinoma), or through follow-up and watchful waiting (e.g., small or unspecific lesion as an incidental finding). Patients with pituitary tumors report impaired quality of life on both physical and mental measures compared to general population [19], with quality of life generally worse in those with ACTH- and growth hormone-secreting tumors [39]. Patients with these tumors may have a lower quality of life despite normal hormonal levels and the absence of neurological deficits [1], but it can improve after surgical treatment [27], suggesting complex biopsychosocial issues. Moreover, impulse control disorders are well documented in patients with prolactinoma receiving dopamine agonists [6]. However, data on the degree of distress among this patient cohort is lacking, particularly for patients with incidental findings.

The aim of this study was to evaluate psychological burden in patients with sellar masses and to compare the symptoms between patients treated conservatively and surgically.

Materials and methods

Study design and patients

Patients for this cross-sectional study were recruited consecutively between 2020 and 2023 at the outpatient service of a neurosurgical department in a university hospital and non-consecutively at two outpatient endocrinological services in Mainz, Germany. Patients were recruited during their routine outpatient visits; approximate initial response rate was 70%. The inclusion criteria were (1) age ≥ 18 years, (2) ability to provide informed consent, (3) radiological diagnosis of sellar mass, and (4) consent to participate. For surgically treated patients, diagnosis was confirmed by histologic examination. For patients with functioning pituitary adenomas treated with medication (e.g., prolactinomas, STH secreting adenomas), the diagnosis was confirmed through endocrinologic examination. In conservatively managed cases, prolactinoma was diagnosed based on prolactin levels exceeding 200 ng/ml and the presence of sellar mass. In certain cases (e.g., suspected Rathke's cleft cyst, small non-functioning pituitary adenoma), no confirmatory tests were possible under radiological control. Patients with histologically confirmed malignant tumors and suspected malignant sellar tumors were excluded from the study. To assess the impact of surgery on psychological burden, patients were divided into two groups: medical treatment/watch-and-wait group and postoperative group. Patients with significant postoperative deficits, such as bitemporal hemianopsia, and

those incapable of self-care (Eastern Cooperative Oncology Group Performance Status ≥ 3) were excluded from the study.

To control for score variation over time, patients were asked to complete the same questionnaires 3 to 6 months after the first examination. The questionnaires were sent to the patients by mail.

Investigations

After signing a consent form, demographic and tumor-specific data were collected using a questionnaire as well as medical and radiological records. The demographic data included sex, age, level of education (higher than secondary or other), occupation, marital status, and comorbidities. Tumor type, localization, extrasellar extent, size, growth, and current medical treatment were recorded. The time since tumor diagnosis and the last significant tumor-specific event (i.e., tumor diagnosis in patients who received medical treatment and radiological follow-up, surgery, or radiotherapy) were considered.

Applied questionnaires

Psychosocial factors were measured using German adaptation of the Distress Thermometer (DT), Hospital Anxiety and Depression Scale (HADS), the Short Form (SF-36), and Sino-Nasal Outcome Test (SNOT).

The SF-36 [2, 38] questionnaire is a widely used multidimensional questionnaire measuring health-related quality of life (HRQOL) and consists of 36 items. The outcomes are measured in 8 subscales describing vitality, physical functioning, physical pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning, and mental health. These subscales can be summarized into a physical component score (PCS) and mental component score (MCS).

The HADS questionnaire consists of items measuring depressive and anxiety symptoms, based on 14 questions [14, 40]. The questions assess anxiety and depression and provide respective scores: anxiety score (HADS-A) and depression score (HADS-D). A score of less than 8 was considered normal, 8–10 as mild, and > 10 as manifest.

The DT is a short screening questionnaire assessing psychological burden on a numerical analog scale from 0 to 10 [12]. It is accompanied by a 40-item problem list of emotional, practical, physical, and spiritual concerns. In our study, ≥ 6 on DT scale was considered a significant burden.

SNOT is a 22-item questionnaire developed to evaluate disease-specific HRQOL in chronic rhinosinusitis [18, 30]. It has been validated and widely used to assess postoperative quality of life in patients undergoing pituitary surgery

[31]. The SNOT-22 score ranges from 0 to 110, with higher scores indicating more symptoms. A stratification of the score into mild (8–20), moderate (21–50), and severe (> 50) has been proposed [34].

Statistics

The sample size was calculated based on the primary outcome, the difference in psychological distress between the conservatively and surgically treated patient groups, as measured using the HADS scale. The null hypothesis was no difference in HADS anxiety score between the groups. The sample size was estimated at 31 patients per group to detect a clinically relevant difference of 3 if the standard deviation does not exceed 4, with the maximum possibility of type I error=5% and type II error=20%.

Categorical data were described as absolute and relative frequencies and continuous data as means and standard deviations. The secondary outcome was psychological distress, as measured using the SF-36, DT, and SNOT questionnaires. Descriptive analysis was conducted. Differences between the groups were assessed using the chi-squared test, Student t-test, or Mann-Whitney test for independent variables and paired samples t-test or Wilcoxon signed rank test for related variables, as appropriate. Correlation between scores of questionnaires was measured using Spearman correlation. Univariate and multivariate logistic regression analyses were conducted to evaluate the association of clinical and demographic characteristics with the scores on the instruments used. Correction for multiple testing was not performed. $P < 0.05$ indicated statistical significance.

Results

Patients

Sixty-two patients, with a mean age of 52.7 (SD 19) years, 56.5% ($n=35$) female were enrolled in the study. Of these, $n=32$ were in the operative group and $n=30$ in the conservative group. The difference arose because one patient was misclassified as being treated conservatively during the recruitment. Prolactinomas were identified in 35%, non-functioning pituitary adenomas in 21.0%, and ACTH-producing adenomas in 6.5% of cases. In 14.5% of cases, the mass entity was unknown, and these patients were followed up with serial MRIs (Table 1). The mean time since the diagnosis was 54.2 (SD 72, range 0.7–340) months, and longer in the postoperative group. The mean time since the last major event (surgery or radiotherapy ($n=4$)) was 36.4 months (SD 33, range 0–143 months). None of the patients in conservative group underwent radiotherapy.

Psychological distress as measured using the HADS and DT

The mean anxiety and depression scores for the study population were 6.2 (SD 4.1) and 5.1 (SD 4.2), respectively. There were no significant differences between the conservative and operative groups in mean anxiety score (6.4 (SD 3.9) vs. 6.0 (SD 4.3), $p=0.76$) or mean depression score (5.7 (SD 4.8) vs. 4.6 (SD 3.6), $p=0.50$) (Fig. 1). The proportion of patients with high levels of anxiety symptoms was similar in the two groups (21.4% vs. 15.6%, $p=0.82$). The HADS-A and HADS-D values observed in this study were not markedly different from the normative values in the German population (4.4 and 4.8 for males and 5.0 and 4.7 for females, respectively) [17]. The proportion of patients with high-level depression symptoms was higher in the conservative group (24.1% vs. 9.4%), though this difference did not reach statistical significance ($p=0.30$). For patients with ACTH-producing adenomas, the mean HADS-A score was significantly higher than for patients without ACTH-producing adenomas (10.3 (SD 1.9) vs. 5.9 (SD 4.0), $p=0.03$). The HADS-D score was marginally insignificant (8.5 (SD 3.1) vs. 4.8 (SD 4.2), $p=0.06$).

The mean DT score for study participants was 4.8 (SD 2.7), and the proportion of patients with significant distress was 41.9%. There was no difference between the study groups (4.7 (SD 2.45) vs. 4.9 (SD 3.0), $p=0.61$) (Fig. 1). The HADS-A, HADS-D and DT scores for different tumor entities are provided in Table 2; statistical comparisons were not performed due to the low number of patients. The most common problems according to the DT problem list were sleep disturbance (55.7%), followed by fatigue (54.1%), pain, and worry (both 52.5%). There was a correlation between DT and MCS (Spearman's Rho (ρ) -0.50, $p < 0.001$), PCS (ρ -0.40, $p=0.002$), HADS-A (ρ 0.60, $p < 0.001$), HADS-D (ρ 0.78, $p < 0.001$), and SNOT total score (ρ 0.33, $p=0.036$).

Quality of life as measured using SF-36

SF-36 analysis demonstrated comparable scores between the conservative and operative groups, with slightly more role limitations due to emotional problems in the conservative group (62.1 (SD 41.5) vs. 79.2 (SD 33.6), $p=0.08$). In general, self-reported mental and physical health was good, with mean MCS scores of 45.2 (SD 8.7) in the operative group and 42.7 (SD 7.7) in conservative group. The mean PCS scores were 44.6 (SD 10.6) and 45.3 (SD 12.1), respectively (Fig. 2). Since MCS and PCS scores are based on a mean of 50 as mean and a standard deviation of 10 in a representative population sample [6], no marked difference in comparison to general population was identified.

Table 1 Patient and tumor characteristics

	Postoperative	Medical treatment/ Watch and wait	Total	<i>p</i> -value
N	32	30	62	
Age (SD)	56 (15)	49(20)	53(19)	0.17
Female, n(%)	21(66)	14(47)	35(56)	0.20
Family situation, n(%)				0.30
Living with partner	16(50)	11(37)	27(44)	
Living alone	9(25)	7(23)	16(26)	
Undisclosed	7(22)	12(40)	19(31)	
Depression or known malignancy, n(%)	3	2		
Watch and wait*, n(%)			9(15)	
Medical treatment, n(%)			21(34)	
Dopamine agonists, n(%)	1(3)	19(63)	20(32)	
Lanreotide, n(%)		1(3)	1(2)	
Post-radiotherapy, n(%)	4(13)			
Pituitary insufficiency, n(%)				
Corticotrophic / hydrocortisone supplementation	16(50)	3(10)	19(31)	0.001
Thyrotrophic insufficiency	13(41)	7(23)	20(32)	0.15
Gonadotrophic insufficiency	10(31)	8(27)	18(29)	0.69
Somatotrophic insufficiency	1(3)	2(7)	3(5)	0.52
Combined	9(28)	10(33)	19(31)	0.66
Tumor size				
Microadenoma, n(%)	3(9)	9(30)	12(19)	0.19
Expansive growth, n(%)	18(56)	13(43)	31(50)	0.45
Progress, n(%)	3(9)	1(3)	4(6)	
Regression, n(%)	0	6(20)	6(10)	
Tumor entity				<0.001
Inactive adenoma, n(%)	13(41)		13(21)	
Prolactinoma, n(%)	3(9)	19(63)	22(35)	
ACTH producing, n(%)	4(13)		4(6)	
STH producing, n(%)	2(6)	1(3)	3(5)	
Gonadotroph, n(%)	3(9)		3(5)	
Mixed, n(%)	2(6)		2(3)	
Other pituitary, n(%)	2(6)		2(3)	
Colloid cyst, n(%)	3(9)		3(5)	
Unknown†, n(%)	0	9(30)	9(15)	
Time after diagnosis, months (SD)	77(87)	29(36)	54(72)	0.01
Time after operation, months (SD)	36(33)		36(33)	

*without hormone substitution,
†no definite histological/endocrinological diagnosis possible (radiologically suspected small inactive pituitary adenomas, Rathke cleft cysts)

Sinonasal symptoms

The mean total SNOT score was 24.8 (SD 19, range 0–84). There was no significant difference in SNOT score between the conservative and operative groups (22.2 (SD 18) vs. 26.8 (SD 21), $p=0.47$). There was no correlation between time since surgery and total SNOT score ($p=0.46$). Two outliers in the postoperative group had very high SNOT scores of 83 and 82. In both cases, the surgical procedures were performed more than 2 years before the examination, so no association between the surgery and the high SNOT score could be established. The proportions of patients within each SNOT category remained similar (Fig. 3). However, the SNOT score correlated significantly with the

DT, HADS-A, and HADS-D scores (Table 3), indicating an association with higher psychological distress.

Identification of patients at risk

We aimed to identify patients at risk of psychological distress. A univariate logistic regression analysis was conducted using putative risk factors. Patients with DT scores ≥ 6 , HADS-A, and HADS-D scores ≥ 11 were considered distressed. The SNOT test sum score was the only factor significantly associated with distress in all three scales (Table 4). Neither the time since diagnosis, treatment, nor tumor progression were significantly associated with distress.

In total, 45 patients (72.6%) completed the follow-up survey. In comparison to the first survey, there were no

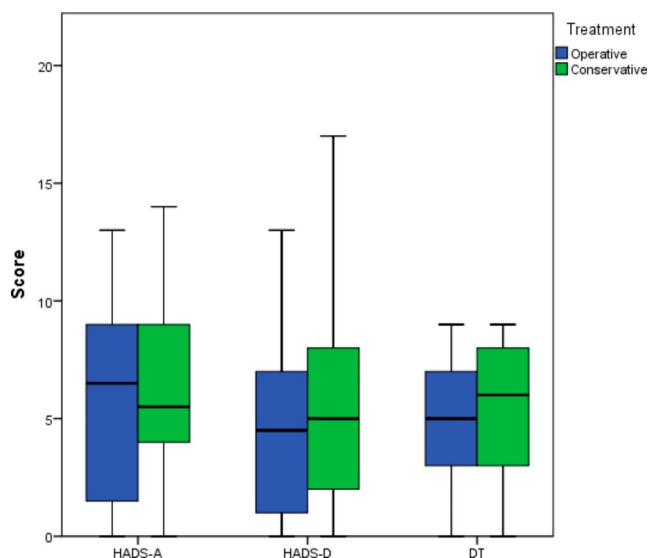


Fig. 1 HADS and DT scores across study groups. HADS-A– anxiety score, HADS-D– depression, DT– distress thermometer

Table 2 HADS and DT scores in different tumor entities at 0 months

Tumor entity	HADS-A, mean (SD)	HADS-D, mean (SD)	DT, mean (SD)
Inactive adenoma			
Prolactinoma	6.4 (3.8)	5.9 (5.1)	4.5 (3.0)
ACTH producing	10.3 (1.9)	8.5 (3.1)	6.0 (2.6)
STH producing	5.3 (5.1)	5.7 (1.5)	6.3 (2.1)
Gonadotroph	9.0 (6.9)	7.7 (3.5)	7.3 (1.2)
Other pituitary	4.3 (4.4)	5.9 (5.1)	4.5 (3.0)
Colloid cyst	5.0 (4.5)	5.9 (5.1)	4.5 (3.0)
Unknown	6.6 (3.9)	4.6 (3.5)	5.9 (2.7)

*due to low number of cases, no statistical comparison between the subgroups was performed

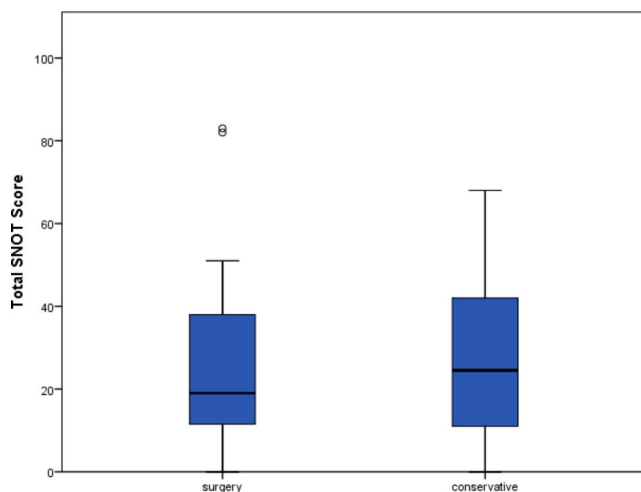


Fig. 3 SNOT score in operated and medically treated/watch-and-wait groups. SNOT– total sino-nasal outcome test score

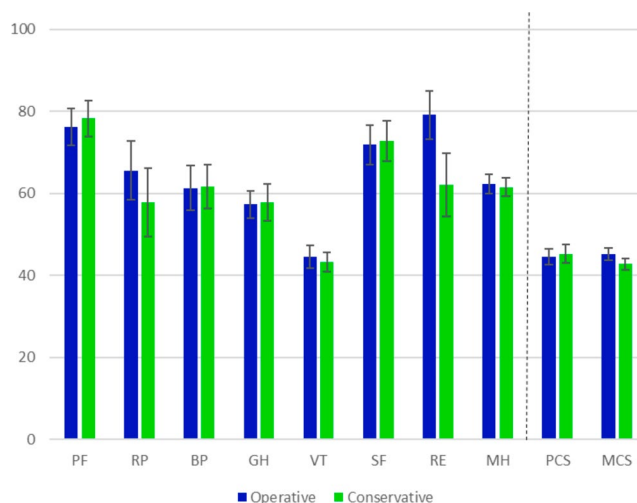


Fig. 2 Average value of SF-36 subscales and composite scores in conservatively and operatively managed patients. PF– physical functioning, RP– role physical, BP– bodily pain, GH– general health, VT– vitality, SF– social functioning, RE– role emotional, MH mental health, PCS– physical component summary, MCS– mental component summary

Table 3 Correlation between scores in study cohort (Spearman's rho)

	SNOT	HADS-A	HADS-D	DT
SNOT		0.759	0.676	0.536
HADS-A	0.759		0.747	0.603
HADS-D	0.676	0.747		0.553
DT	0.536	0.603	0.553	

*all P values < 0.001

significant differences concerning age, sex and group attribution. We did not find significant differences in mean HADS, DT, SF-36, or SNOT scores during this period in comparison to the first survey conducted in the outpatient department (Fig. 4).

Discussion

This study confirms that there is no significant difference in self-reported distress, anxiety, depression, or quality of life between patients with operatively and conservatively managed sellar masses. The results of the 3-6-month follow-up survey further support this conclusion.

In our cohort, the mean DT score was 4.8 (SD 2.7), which is higher than in the German general population sample (3.2 (SD 2.6) [16] but comparable to the mean score in patients with meningiomas 4.5 (SD 2.5) [20]. Similar to our findings, in a study of patients operated on inactive pituitary adenomas, elevated depression and distress scores were found [21]. Lower quality of life has been reported in patients with prolactinomas, other secreting adenomas, and non-functioning tumors [3, 35]. Interestingly, the mean

Table 4 Univariate logistic regression analysis for the clinically significant distress scores. OR—odds ratio, 95%CI—confidence interval, HADS-D Depression score, HADS-A anxiety score, DT Distress thermometer score, SNOT—total sino-nasal outcome test score. The asterisk marks statistically significant values

Variable	OR (95%CI)		
	DT≥6	HADS-A≥11	HADS-D≥11
Gender	1.35 (0.48–3.78)	1.32 (0.46–3.81)	0.80 (0.25–2.60)
Age≥65 years	0.90 (0.30–2.73)	0.97 (0.31–3.01)	0.36 (0.11–1.22)
Single vs. partnership	2.38 (0.66–8.56)	1.02 (0.28–3.66)	2.64 (0.65–10.73)
Pituitary insufficiency (multiple axes)	1.36 (0.43–4.33)	0.40 (0.12–1.35)	0.55 (0.19–1.66)
Cortisone Therapy	0.71 (0.23–2.15)	1.10 (0.36–3.38)	1.33 (0.36–4.88)
Cabergoline (or other)	1.42 (0.47–4.31)	1.10 (0.36–3.38)	0.88 (0.25–3.04)
SNOT*	1.04 (1.01–1.07) <i>P</i> =0.02	1.12 (1.06–1.19) <i>P</i> <0.001	1.05 (1.01–1.08) <i>P</i> =0.01
Operative vs. conservative treatment	0.49 (0.17–1.37)	0.93 (0.33–2.63)	0.51 (0.16–1.68)
Expansive tumor growth	1.36 (0.47–3.91)	0.89 (0.30–2.65)	1.03 (0.30–3.56)
Tumor size (micro vs. macro)	1.63 (0.48–5.50)	1.02 (0.28–3.65)	0.53 (0.10–2.80)
Time since diagnosis	1.00 (0.99–1.01)	0.99 (0.98–1.00)	1.00 (0.99–1.01)
Time since treatment	1.00 (0.98–1.03)	1.00 (0.98–1.03)	1.00 (0.97–1.03)
Tumor progress	1.49 (0.34–6.67)	1.92 (0.43–9.09)	1.27 (0.22–7.14)
Tumor regression	0.65 (0.11–3.85)	0.29 (0.03–2.63)	-

DT score of patients with malignant brain tumor (glioblastoma) in patients under 65 years of age was similar at 4.9 (SD 2.6) [29]. These results are consistent with those of other studies, showing that the patients with low-grade brain tumors may experience as much psycho-oncological distress as patients with a higher-grade brain tumor [15, 26]. Our study included postoperative and conservatively managed patients as well as patients with uncertain, possibly non-neoplastic entities. Regardless of tumor entity, one of the possible explanations for increased distress may be unmet information needs, which can be addressed through improvement of patient information and education [7]. Different perspectives and expectations between patients and health care providers may provide additional distress. Patients with hormonal imbalance may develop elevated levels of distress [5]. For example, in our study, the patients with ACTH-producing adenomas exhibited elevated levels

of anxiety and depression, consistent with previous studies that have shown persistent physical and mental effects, even in remission [4, 23]. However, study participants with pituitary insufficiency were well compensated and did not show signs of elevated distress. A recent study demonstrated that more than 20% of patients with Cushing disease believed they had no choices in their treatment, in contrast to only 1% of health care providers [13]. This highlights the need for routine patient education and psychooncological screening in outpatient oncological care, regardless of tumor type and aggressiveness.

Compared to the surgically and conservatively managed patients with meningiomas who were recruited for a similar survey at our department [20], patients with sellar tumors demonstrated significantly lower levels of anxiety and depression (10.0 (SD 1.9) and 11.1 (SD 1.7), *p*<0.001 for both comparisons). Moreover, HADS-A and HADS-D values observed in the current study (6.2 (SD 4.1) and 5.1 (SD 4.2)) did not deviate from the normative values in the German population [17]. The similarities in the DT score between sellar tumors and meningiomas make it challenging to explain the differences in the level of anxiety and depression between the two entities. However, based on our analysis, we state that further research is needed to fully understand the underlying factors. Sellar tumors are commonly perceived by patients as being located in a certain isolated area, not directly adjacent to the brain, which may lead to a lower level of distress. A comparison of the emotional burden of patients with anterior skull base meningioma and pituitary adenoma revealed that the patients with pituitary adenoma tended to score higher in anxiety whereas patients with meningioma tended to score higher in depression [37].

Our study included patients early after a diagnosis of sellar tumor was made as well as those who had been exposed to the diagnosis for several years. Moreover, we could not identify any changes in self-reported distress in short-term follow-up at home, which might hypothetically have reflected the distress caused by the outpatient visit. Interestingly, no association between DT, HADS-A, or HADS-D score and time since diagnosis or last treatment was observed. Because data on pituitary masses is scarce, a study on skull base meningiomas demonstrated no difference in main aspects of quality of life 5 years of more after the last intervention in comparison to the control group [10]. In contrast, another study on meningioma patients reported relevant distress nearly a decade after operation or tumor diagnosis [22].

Among all the sociodemographic and tumor-associated factors investigated, only the total SNOT score was associated with elevated distress in DT and HADS scales. Notably, the SNOT-22 correlated significantly with DT, HADS-A,

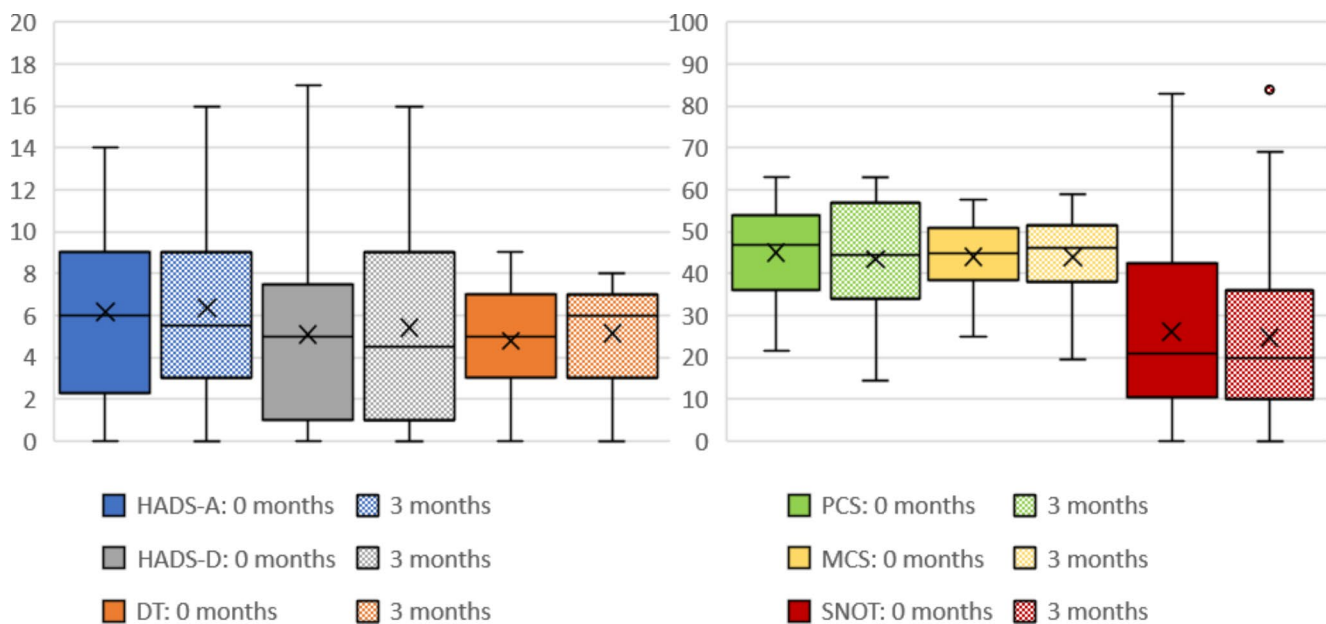


Fig. 4 Development of mean score of applied questionnaires over time. HADS-A– anxiety score, HADS-D– depression, DT– Distress Thermometer, PCS– physical component summary, MCS– mental component summary, SNOT– total Sino-Nasal Outcome Test score

and HADS-D scores. Lauriello et al. [24] reported a correlation between SNOT and HADS-A but not HADS-D in patients with allergic rhinitis. Conversely, a study of SNOT-22 in a control population revealed an association between depression and a higher SNOT score [9]. It is a well-established fact that patients with chronic rhinosinusitis have a significantly higher incidence of depression and anxiety than healthy controls [8]. Additionally, a high SNOT score has been linked with a lower quality of life [28]. A subjective postoperative outcome after nasal surgery according to SNOT showed satisfactory results and was not different in comparison from the conservative group, except for two outliers. This demonstrates the safety of transnasal pituitary surgery and its infrequent association with postoperative symptoms. Surgical removal of the prolactinomas should be considered a viable alternative, especially given the impulse control issues under dopamine agonist therapy [6].

Limitations

This study has some limitations. First, although it was conducted in a neurosurgical center and two outpatient endocrinological services, which provides valuable insights into the field, the sample size was calculated specifically to evaluate differences of self-reported distress between study groups; therefore, further analyses are exploratory. Patient recruitment was not consecutive at outpatient endocrinological services, which may contribute to selection bias. Our analysis did not show any significant differences between the two subgroups, patients receiving conservative treatment

and patients under a wait-and-watch strategy without active treatment. However, it is important to note that the number of patients in these subgroups is relative, which precludes further subgroup analysis.

Despite these shortcomings, this study shows that patients with sellar tumors experience less distress than those with other brain tumors. However, further research is needed to determine the factors that contribute to patient distress. In the meantime, it is recommended that regular patient screening (e.g. using DT) be implemented in the outpatient department to identify patients at risk and provide appropriate counseling.

Conclusions

In our cohort, the level of self-reported distress in patients with sellar masses was not associated with a specific treatment strategy. ACTH-producing adenomas and manifest nasal symptoms were associated with higher psychological distress. Routine screening is necessary to identify patients in need of psychooncological support.

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D.K.; Writing–Review & Editing, D.K., S.M., A.E., W.O., C.W., N.K., F.R., J.C.; Supervision J.C., F.R.; All authors read and approved the final manuscript.

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Data availability No datasets were generated or analysed during the current study.

Declarations

Ethical approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Rhineland-Palatinate, Germany (2020–15237_1). Informed consent was obtained from all individual participants included in the study.

Competing interests The authors declare no competing interests.

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